

**REMARKS/ARGUMENTS**

Claim 1 has been amended to recite the subject matter of as-filed claim 16. Claim 16 has been amended to recite percentages of the hafnium and thermoplastic terpolymer of tetrafluoroethylene, hexafluoropropylene, and vinylidene fluoride. New claims 52 and 53 have been added. Support for the amendments to claim 16 and for new claims 52 and 53 is found in the as-filed specification at at least paragraphs [0010], [0035], and [0037]. Claims 50 and 51 have been amended to improve the clarity of the claims and to correct claim dependencies. No new matter has been added.

The Office Action mailed June 14, 2007, has been received and reviewed. Claims 1, 5-8, 10-28, 30-33, and 35-51 are currently pending in the application. Claims 5-8, 10-15, 17-24, 27, 28, 30-33, and 35-49 have been withdrawn. Claims 1, 16, 25, 26, 50, and 51 stand rejected. Claims 5-8, 10-15, 17-24, 27, 28, 30-33, and 35-49 are canceled herein without prejudice or disclaimer to the filing of one or more divisional applications including the subject matter thereof. Applicants have amended claims 1, 16, 50, and 51, added new claims 52 and 53, and respectfully request reconsideration of the application as amended herein.

**Information Disclosure Statement(s)**

Applicants note the filing of a Supplemental Information Disclosure Statement herein on September 19, 2006, and note that no copy of the Form PTO/SB/08 was returned with the outstanding Office Action. Applicants respectfully request that the information cited on the Form PTO/SB/08 be made of record herein.

**35 U.S.C. § 112 Claim Rejection**

Claims 1, 25, 26, 50, and 51 stand rejected under 35 U.S.C. § 112, first paragraph, as allegedly containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

In light of the amendments to claim 1, Applicants respectfully request withdrawal of this rejection.

**35 U.S.C. § 102(b) Anticipation Rejections**

Anticipation Rejection Based on U.S. Patent No. 6,896,751 to Posson *et al.*

Claims 1, 25, and 26 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,896,751 to Posson *et al.* (“Posson 751”). Applicants respectfully traverse this rejection, as hereinafter set forth.

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Brothers v. Union Oil Co. of California*, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 U.S.P.Q.2d 1913, 1920 (Fed. Cir. 1989).

Posson ‘751 describes a propellant composition that includes a fuel, an oxidizer, and a latex binder. Posson ‘751 at the Abstract, column 1, lines 7-9, column 2, lines 27-30, column 3, lines 34-37, and Table 1. The fuel is a metallic powder, such as silicon, boron, aluminum, magnesium, or titanium. *Id.* at column 4, lines 59-66. The oxidizer is an alkali metal nitrate, bromate, chlorate, or perchlorate, a solid nitramine, or an inorganic halogen-containing compound. *Id.* at column 5, lines 31-58. The latex binder is a fluoropolymer, such as a terpolymer of hexafluoropropylene, vinylidene fluoride, and tetrafluoroethylene. *Id.* at column 4, lines 2-11. Plasticizers, curing agents, catalysts, burn rate modifiers, antioxidants, dispersants, lubricants, anti-static agents, or mold release agents may be present in the propellant composition. *Id.* at column 2, lines 31-35, column 3, lines 38-41, and column 6, lines 28-38.

The anticipation rejection of claims 1, 25, and 26 is improper because Posson ‘751 does not expressly or inherently describe each and every element of claim 1. Specifically, Posson ‘751 does not expressly or inherently the element of a composition “comprising hafnium and a thermoplastic terpolymer of tetrafluoroethylene, hexafluoropropylene, and vinylidene fluoride,” as recited in claim 1 because Posson ‘751 does not expressly or inherently describe the recited metal.

Claims 25 and 26 are allowable, *inter alia*, as depending from an allowable claim.

New claims 52 and 53 are allowable because Posson ‘751 does not expressly or inherently describe a composition “consisting of hafnium and a thermoplastic terpolymer of

tetrafluoroethylene, hexafluoropropylene, and vinylidene fluoride,” as recited in independent claim 52, for substantially the same reasons as described above.

### 35 U.S.C. § 103(a) Obviousness Rejections

#### Obviousness Rejection Based on Posson ‘751 in view of U.S. Patent No. 6,635,130 to Koch

Claim 16 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Posson ‘751 as applied to claims 1, 25, and 26, and further in view of U.S. Patent No. 6,635,130 to Koch (“Koch”). Since subject matter similar to that of pending claim 16 has been incorporated into claim 1, Applicants treat the instant rejection as applying to claim 1. Applicants respectfully traverse this rejection, as hereinafter set forth.

To establish a *prima facie* case of obviousness, the prior art reference (or references when combined) must teach or suggest all of the claim limitations. *In re Royka*, 490 F.2d 981, 985 (CCPA 1974); *see also* M.P.E.P. § 2143.03. Additionally, there must be “a reason that would have prompted a person of ordinary skill in the relevant field to combine the [prior art] elements” in the manner claimed. *KSR Int’l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1742, 167 L.Ed.2d 705, 75 USLW 4289, 82 U.S.P.Q.2d 1385 (2007). Finally, to establish a *prima facie* case of obviousness, there must be a reasonable expectation of success. *In re Merck & Co., Inc.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986). Furthermore, the reason that would have prompted the combination and the reasonable expectation of success must be found in the prior art, common knowledge, or the nature of the problem itself, and not based on the Applicant’s disclosure. *DyStar Textilfarben GmbH & Co. Deutschland KG v. C. H. Patrick Co.*, 464 F.3d 1356, 1367 (Fed. Cir. 2006); M.P.E.P. § 2144. Underlying the obviousness determination is the fact that statutorily prohibited hindsight cannot be used. *KSR*, 127 S.Ct. at 1742; *DyStar*, 464 F.3d at 1367.

The description of Posson ‘751 is as previously summarized.

Koch describes a pyrotechnic composition that includes a halophilic metallic fuel, a poly-(carbon monofluoride), an organic fluorine-bearing agent, and graphite. Koch at column 2, lines 44-52. The halophilic metallic fuel is magnesium, aluminum, titanium, zirconium, hafnium, calcium, beryllium, or boron. *Id.* at column 2, lines 44-52. The organic fluorine-bearing agent is a copolymer of vinylidene fluoride and hexafluoropropylene. *Id.* at column 4, lines 35-40.

The obviousness rejection of claim 1 is improper because the applied references do not teach or suggest all of the limitations of claim 1. Specifically, Posson '751 and Koch, alone or in combination, do not teach or suggest a composition that comprises "hafnium and a thermoplastic terpolymer of tetrafluoroethylene, hexafluoropropylene, and vinylidene fluoride," as recited in claim 1. Posson '751 does not teach or suggest this limitation for the reasons previously discussed. Koch does not cure the deficiencies in Posson '751 because the organic fluorine-bearing agent used in Koch is a copolymer of vinylidene fluoride and hexafluoropropylene and is not a terpolymer of tetrafluoroethylene, hexafluoropropylene, and vinylidene fluoride.

In addition, the applied references, common knowledge, and the nature of the problem do not provide a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the manner claimed. The Examiner states that "[i]t would have been obvious to one having ordinary skill in the art at the time the invention was made to use hafnium as taught by Koch since Koch indicates that it is a known fuel to use with fluorocarbons and also since Koch indicates its equivalence as a fuel with other metal fuels, such as magnesium and aluminum which are the fuels used in Posson." Office Action of June 14, 2007, p. 4. However, nothing in Posson '751 provides a reason to utilize a metal other than silicon, boron, aluminum, magnesium, or titanium. In addition, nothing in Koch provides a reason to utilize a terpolymer, such as a terpolymer of tetrafluoroethylene, hexafluoropropylene, and vinylidene fluoride. Furthermore, nothing in the common knowledge and in the nature of the problem would have prompted a person of ordinary skill in the relevant field to combine Posson '751 and Koch. Therefore, it appears that any reason for combining Posson '751 and Koch is improperly based on the Applicants' disclosure.

Claims 25 and 26 are allowable, *inter alia*, as depending from an allowable base claim.

New claims 52 and 53 are allowable for substantially the same reasons as described above.

Obviousness Rejection Based on Posson '751 in view of Koch and further in view of U.S. Patent No. 6,427,599 to Posson *et al.*

Dependent claims 50 and 51 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Posson '751 in view of Koch as applied to claims 1, 16, 25 and 26, and further

in view of U.S. Patent No. 6,427,599 to Posson *et al.* ("Posson '599"). Applicants respectfully traverse this rejection, as hereinafter set forth.

Dependent claims 50 and 51 are allowable, *inter alia*, as depending from an allowable base claim.

Obviousness Rejection Based on U.S. Patent No. 4,131,498 to Lucy in view of Posson '751

Claims 1, 16, 25, and 26 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 4,131,498 to Lucy ("Lucy") in view of Posson '751. Applicants respectfully traverse this rejection, as hereinafter set forth.

Lucy describes an incendiary composition that includes a zirconium or hafnium sponge metal and a binder. Lucy at column 1, lines 10-13. The sponge metal has an increased surface area to mass ratio compared to zirconium or hafnium metal. *Id.* at column 2, lines 37-52 and column 3, lines 20-26. Zirconium or hafnium is used in the incendiary composition because these metals are large and heavy. *Id.* Compositions including smaller and lighter metals undesirably have a high and slow ignition and do not burn on impact. *Id.* The binder is a fluoroalkylene polymer, such as a homopolymer of perfluoropropylene or a copolymer of perfluoropropylene and vinylidene fluoride. *Id.* at column 4, lines 13-23.

The description of Posson '751 is as previously summarized.

The obviousness rejection of claim 1 is improper because the applied references, common knowledge, and the nature of the problem do not provide a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the manner claimed. The Examiner states that "[i]t would have been obvious to one having ordinary skill in the art at the time the invention was made to use the terpolymer taught by Posson with the composition disclosed by Lucy since Lucy discloses that various fluoropolymers may be used with the hafnium metal and since Posson indicates that the terpolymer of hexafluoropropylene, vinylidene fluoride, and tetrafluoroethylene is useful with various metal fuels." Office Action of June 14, 2007, p. 5. However, nothing in the applied references, common knowledge, or the nature of the problem provides support for this statement.

Furthermore, the metals described in Posson '751 include silicon, boron, aluminum, magnesium, or titanium, while Lucy describes using larger, heavier metals, such as zirconium or

hafnium. In actuality, Lucy teaches away from combination with Posson '751 to produce the claimed invention because Lucy describes that a composition including smaller and lighter metals, such as those in Posson '751, undesirably has a high and slow ignition and does not burn on impact. Since Lucy and Posson '751 teach away from the claimed invention, it appears that any reason for combining Lucy and Posson '751 is improperly based on the Applicants' disclosure.

Claims 16, 25, and 26 are allowable, *inter alia*, as depending from an allowable base claim.

New claims 52 and 53 are allowable for substantially the same reasons as described above.

**ENTRY OF AMENDMENTS**

The amendments to claims 1, 16, 50, and 51 should be entered by the Examiner because the amendments are supported by the as-filed specification and drawings and do not add new matter to the application.

**CONCLUSION**

Claims 1, 16, 25, 26, and 50-53 are believed to be in condition for allowance, and an early notice thereof is respectfully solicited. Should the Examiner determine that additional issues remain which might be resolved by a telephone conference, she is respectfully invited to contact Applicants' undersigned attorney.

Respectfully submitted,



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Date: September 12, 2007

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